

Problem H. Hardtown

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 1024 mebibytes

Hardtown is a city consisting of N towns numbered from 1 to N . The previous mayor of this city constructed a single road between each pair of towns. However, every road is not wide enough and hence is one-directional. In other words, for any two different towns i and j , there is a single road that you can pass either from i to j or from j to i , but not both.

Because of the sloppy city planning, you suspect that there may be two different towns such that you cannot travel from one town to the other by passing through one or more roads. If so, as a new mayor of this city, you have to resolve this problem. Unfortunately, there is not enough space to make each road bidirectional nor construct new roads. Therefore, you instead decided to reverse the directions of some roads.

For each pair of towns, you are given the initial direction of the road between these two towns and the cost to reverse the direction. You can reverse the directions of zero or more roads. After that, you must be able to travel from any town to any other town by passing through roads. Your task is to calculate the minimum total cost to achieve it. Under the constraints of this problem, it can be proven that a solution always exists.

Input

The first line consists of an integer N between 3 and 3000, inclusive. This represents the number of towns in this city.

The i -th of the following $N - 1$ lines consists of $N - i$ non-zero integers $c_{i,i+1}, c_{i,i+2}, \dots, c_{i,N}$, each between -10^9 and 10^9 , inclusive. For each i and j ($1 \leq i < j \leq N$), $c_{i,j}$ represents the information about the road between towns i and j . If $c_{i,j}$ is positive, then you can initially pass through this road from i to j only. Otherwise, you can initially pass through this road from j to i only. In either case, the absolute value $|c_{i,j}|$ is the cost to reverse the direction of this road.

Output

Output a line with a single integer: the minimum total cost of the roads which can be reversed so that you can travel from any town to any other town.

Examples

<i>standard input</i>	<i>standard output</i>
7 -17 -76 -46 -94 83 -22 53 -59 95 42 82 -31 66 26 12 71 96 56 65 -29 -23	57
7 -17 -76 -46 -94 83 -22 53 -59 95 42 82 31 66 -26 12 71 96 56 65 -29 -23	0